

Toward these ends, a club head 210 is illustrated having a top wall 211 and an integral hosel 212 having an upper surface 213 that is substantially coplanar with top wall 211 or projects slightly upwardly therefrom. Hosel 212 has a downwardly projecting annular portion 214 with a hosel bore 215 therein that has an annular chamfer 218 at its upper end that is coplanar with the top surface 213 as opposed to being spaced downwardly therefrom as in the FIGS. 14, 15 and 16 embodiment.

A plastic ferrule 220 is mounted on the top surface 213, and it has a through bore 221 therein coaxial with hosel bore 215.

The ferrule 220 has an integral annular flange 224 projecting downwardly therefrom as seen in FIG. 18, having an inner diameter substantially larger than bore 221 that is seated in an annular groove 225 in hosel top surface 213. The annular groove 225 could also be formed directly in top wall 211 if the geometry of the club head permitted this relationship.

The larger diameter of the flange 224 in this embodiment can in some cases provide greater resistance to torquing loads on the ferrule than the flange geometry in the FIGS. 14, 15 and 16 embodiment.

It should be understood that in both the embodiments illustrated in FIGS. 14, 15 and 16, and the embodiment illustrated in FIGS. 17, 18 and 19, that the lower surfaces of the ferrule, the ferrule flanges, and the grooves receiving the ferrule flanges all are epoxied as the ferrule is assembled and bonded to the club head.

A further embodiment of the present invention is illustrated in FIGS. 20, 21, and 22 and in this embodiment the ferrule has a threaded flange that is received in a threaded counter bore in the hosel, and this design provides somewhat greater resistance to torquing loads than in the embodiments illustrated in FIGS. 1 to 19, and also a somewhat greater cushioning effect for the shaft, but the trade-off in this design is the ferrule shape is substantially confined to an annular configuration in the sense that it cannot accommodate the cosmetic flares of the club head top wall that surround the hosel described in connection with the above embodiments.

Toward these ends, a club head 310 is illustrated having a top wall 311 and an integral hosel 312. The hosel 312 has a planar upper surface 313 that projects a short distance above the top wall 211. Hosel 312 has a stepped downward projection 314 having a shaft receiving bore 315 therein with a lower stop 316 as in the other embodiments.

The upper end of the hosel bore has an extended counter bore 318 that is threaded, as also seen in FIG. 21. The counter bore 318 is substantially longer axially than in the other embodiments and is in the range of 0.250 inches and above. An annular ferrule 322 is threaded in counter bore 318 and has an annular upper portion 324, a flat lower surface 325 seated on club head surface 313, and an integral annular threaded downwardly depending flange 326 threadedly received in counter bore 318. The inner engaging threaded surfaces between ferrule 322 and the hosel 312 receive epoxy during assembly as do the surfaces 313 and 325.

I claim:

1. A golf club head, comprising: a golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel in the club

head having a top surface that is coplanar with or projects upwardly a short distance from the top wall, and a ferrule constructed of a material substantially lighter than the club head mounted against the top surface of the hosel, said ferrule having a downwardly depending flange seated in a groove in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is tangent to the upper surface of the top wall adjacent the hosel.

2. A golf club head as defined in claim 1, wherein the club head groove is an annular groove in the club head, said ferrule flange being annular and seated within the annular groove in the club head.

3. A golf club head as defined in claim 2, wherein the hosel has a shaft receiving bore therein, said groove in the club head being a counter bore in the hosel bore.

4. A golf club head as defined in claim 2, wherein the hosel has a shaft receiving bore therein, said annular groove being spaced radially outwardly from the hosel bore in the club head top wall.

5. A golf club head as defined in claim 2, wherein said annular groove in the club head is threaded and engages threads in the ferrule annular flange.

6. A golf club head, comprising: a metallic golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel integral with the club head with a top surface coplanar with or projecting upwardly from the top wall less than 0.200 inches, said hosel having a shaft receiving bore therein, an annular groove in the club head coaxial with the hosel bore, and a lightweight non-metallic ferrule seated on the hosel top surface, said ferrule having an integral downwardly depending annular flange seated in the annular groove in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is tangent to the upper surface of the top wall adjacent the hosel.

7. (Amended) A golf club head, comprising: a metallic golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel integral with the club head with a top surface coplanar with or projecting upwardly from the top wall less than 0.200 inches, said hosel having a shaft receiving bore therein, a threaded counter bore in the top of the hosel bore, and a lightweight non-metallic ferrule seated on the hosel top surface having an integral threaded downwardly depending annular flange threadedly seated in the hosel counter bore to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the [ton] top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is tangent to the upper surface of the top wall adjacent the hosel.

8. A golf club head, comprising: a golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel in the club head, and a ferrule constructed of a material substantially lighter than the club head mounted adjacent the hosel, said ferrule having a downwardly depend-

ing flange seated in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is tangent to the upper surface of the top wall adjacent the hosel.

9. A golf club head, comprising: a metallic golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel integral with the club head with a top surface coplanar with or projecting upwardly from the top wall less than 0.200 inches, said hosel having a shaft receiving bore therein, said hosel bore having an enlarged upper portion, and a lightweight non-metallic ferrule seated adjacent the hosel, said ferrule having an integral downwardly depending flange seated in the hosel bore upper portion in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is tangent to the upper surface of the top wall adjacent the hosel.

10. A golf club head, comprising: a golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel in the club head, and a ferrule constructed of a material substantially lighter than the club head mounted adjacent the hosel, said ferrule having a downwardly depending flange seated in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is substantially tangent to the upper surface of the top wall adjacent the hosel.

11. A golf club head, comprising: a metallic golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel integral with the club head with a top surface coplanar with or projecting upwardly from the top wall less than 0.200 inches, said hosel having a shaft receiving bore therein, said hosel bore having an enlarged upper portion, and a lightweight non-metallic ferrule seated adjacent the hosel, said ferrule having an integral

downwardly depending flange seated in the hosel enlarged upper portion in the club head to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion to the lower portion sufficiently so its lower end is substantially tangent to the upper surface of the top wall adjacent the hosel.

12. A golf club head, comprising: a metallic golf club head including a ball striking face and a top wall, means to reduce club head weight and permit the saved weight to be redistributed in the club head including a light weight hosel integral with the club head with a top surface coplanar with or projecting upwardly from the top wall less than 0.200 inches, said hosel having a shaft receiving bore therein, a threaded counter bore in the top of the hosel bore, and a lightweight non-metallic ferrule seated on the hosel top surface having an integral threaded downwardly depending annular flange threadedly seated in the hosel counter bore to resist side loading on the ferrule, said ferrule having an upper small diameter portion and a lower large diameter portion to blend into the upper surface of the top wall adjacent the hosel, said ferrule having an outer surface that curves outwardly from the upper portion

to the lower portion sufficiently so its lower end is substantially tangent to the upper surface of the top wall adjacent the hosel.